selected from a decrease in forced expiratory volume in one second (FEV_1), pulmonary exacerbation (PE) frequency, FEV1-indicated exacerbation signal (FIES), ventilation defect percent (VDP), abnormal lung heterogeneity in lung as measured via imaging, lung hyperinflation, and combinations thereof.

3. The method of claim **1**, wherein said covariate is a clinical measure selected from forced expiratory volume in one second (FEV_1), body mass index percentile (BMI), pulmonary exacerbation (PE) frequency, historic lung function, ventilation defect percent (VDP), partial ventilation data, ventilation heterogeneity data, hyper-intensity data, FEV1-indicated exacerbation signal (FIES), and combinations thereof.

4. The method of claim **1**, wherein said covariate is a biomarker described in Table 1, Table 2, Table 3, or Table 4, said determining comprising determining an expression level of a protein described in Table 1, Table 2, Table 3, or Table 4.

5. The method of claim **1**, said covariate being an imaging marker.

6. The method of claim **4**, said imaging marker being a functional lung measurement, a structural lung measurement, or combinations thereof.

7. The method of claim **5**, said imaging marker being obtained by an imaging method.

8. The method of claim **6**, said image technique being selected from hyperpolarized (HP) 129Xe, Ultra-short Echotime (UTE) Magnetic resonance imaging (MRI), computed tomography (CT), and combinations thereof.

9. The method of claim **4**, said imaging marker being structural remodeling.

10. The method of claim **4**, said imaging marker being bronchiectasis.

11. The method of claim **1**, said predicted lung impairment being a non-linear decline in one or more parameters selected from Ventilation Defect Percentage (VDP), FEV_1, partial ventilation, ventilation heterogeneity, ventilation hyper-intensity or a combination thereof.

12. The method of claim **1**, said individual having normal FEV_1 at the time of said determining and said calculating.

13. The method of claim **1**, said risk probability score predicting the probability of lung function decline over a period selected from three weeks to four months, or six months, or twelve months.

14. The method of claim **1**, wherein non-linear lung function decline is defined as a rate of change in longitudinal FEV_1 that falls below 1.5% predicted/year.

15. The method of claim **1**, wherein non-linear lung function decline is defined by the FEV1-indicated exacerbation signal (FIES) score.

16. The method of claim **1**, said one or more covariates comprising a time-varying covariate.

17. The method of claim **15**, said time-varying covariate comprising infections with Pa, MRSA, CF-related diabetes and use of state insurance as a marker of socioeconomic status.

18. The method of claim **1**, wherein said biomarker is one or more biomarkers selected from Table 1.

19. The method of claim **1**, wherein said biomarker is one or more biomarkers selected from Table 2.

20. The method of claim **1**, wherein said biomarker is one or more biomarkers selected from Table 3.

21. The method of claim **1**, wherein said biomarker is one or more biomarkers selected from Table 4.

22. The method of claim **1**, wherein said individual is diagnosed with cystic fibrosis (CF).

23. The method of claim **1** wherein said individual is diagnosed with cystic fibrosis (CF) and has a normal forced expiratory volume in one second (FEV_1) as measured by spirometry.

24. The method of claim **1**, wherein said individual is a pediatric patient having cystic fibrosis (CF).

25. The method of claim **1**, wherein said individual is a patient under the age of 13 years of age and having cystic fibrosis (CF).

26. The method of claim **1**, wherein said method forecasts lung function trajectory for a period of about three weeks to about six months, or about six months to about twelve months.

27. The method of claim **1**, further comprising applying a statistical algorithm to estimate correlation between a covariate value and predicted lung function.

28. The method of claim **1**, wherein said method is carried out via a computer system, and wherein said method comprises capturing and displaying information related to said characterization of said individual using a graphical user interface (GUI).

29. The method of claim **1**, further comprising assessing a variable selected from one or more of sex, body mass index (BMI), pulmonary exacerbation (PE), number of hospitalizations, antibiotic status, infection status, and combinations thereof, in said individual.

30. The method of claim **1**, wherein said lung function decline is defined by one or more of absolute change in FEV_1, rate of decline, risk of non-linear decline, FIES.

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